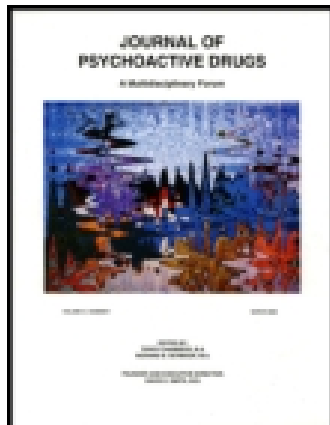


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### "Spice," "Kryptonite," "Black Mamba": An Overview of Brand Names and Marketing Strategies of Novel Psychoactive Substances on the Web

Ornella Corazza Ph.D.<sup>a</sup>, Giuseppe Valeriani M.D.<sup>b</sup>, Francesco Saverio Bersani M.D.<sup>b</sup>, John Corkery M.Phil.<sup>c</sup>, Giovanni Martinotti M.D., Ph.D.<sup>d</sup>, Giuseppe Bersani M.D.<sup>e</sup> & Fabrizio Schifano M.D., MRCPsych<sup>f</sup>

<sup>a</sup> Principal Lecturer and Academic Research Lead, School of Life and Medical Sciences, University of Hertfordshire, Hertfordshire, UK

<sup>b</sup> Resident Physician, Department of Neurology and Psychiatry, Sapienza University of Rome, Rome, Italy

<sup>c</sup> Senior Researcher, School of Pharmacy, University of Hertfordshire, Hertfordshire, UK

<sup>d</sup> Senior Researcher, Department of Neuroscience and Imaging, Gabriele d'Annunzio University, Chieti, Italy

<sup>e</sup> Chair in Psychiatry, Department of Medical-Surgical Sciences and Biotechnologies, Sapienza University of Rome, Rome, Italy

<sup>f</sup> Chair in Clinical Pharmacology and Therapeutics, School of Pharmacy, University of Hertfordshire, Hertfordshire, UK

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# “Spice,” “Kryptonite,” “Black Mamba”: An Overview of Brand Names and Marketing Strategies of Novel Psychoactive Substances on the Web

Ornella Corazza, Ph.D.<sup>a</sup>; Giuseppe Valeriani, M.D.<sup>b</sup>; Francesco Saverio Bersani, M.D.<sup>b</sup>;  
John Corkery, M.Phil.<sup>c</sup>; Giovanni Martinotti, M.D., Ph.D.<sup>d</sup>; Giuseppe Bersani, M.D.<sup>e</sup>  
& Fabrizio Schifano, M.D., MRCPsych<sup>f</sup>

**Abstract**—*Introduction:* Novel Psychoactive Substances (NPSs) are often sold online as “legal” and “safer” alternatives to International Controlled Drugs (ICDs) with captivating marketing strategies. Our aim was to review and summarize such strategies in terms of the appearance of the products, the brand names, and the latest trends in the illicit online marketplaces. *Methods:* Scientific data were searched in PsychInfo and Pubmed databases; results were integrated with an extensive monitoring of Internet (websites, online shops, chat rooms, fora, social networks) and media sources in nine languages (English, French, Farsi, Portuguese, Arabic, Russian, Spanish, and Chinese simplified/traditional) available from secure databases of the Global Public Health Intelligence Network. *Results:* Evolving strategies for the online diffusion and the retail of NPSs have been identified, including discounts and periodic offers on chosen products. Advertisements and new brand names have been designed to attract customers, especially young people. An increased number of retailers have been recorded as well as new Web platforms and privacy systems. *Discussion:* NPSs represent an unprecedented challenge in the field of public health with social, cultural, legal, and political implications. Web monitoring activities are essential for mapping the diffusion of NPSs and for supporting innovative Web-based prevention programmes.

**Keywords**—brand names, Internet monitoring, legal highs, marketing, novel psychoactive substances, PIEDs

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<sup>a</sup>Principal Lecturer and Academic Research Lead, School of Life and Medical Sciences, University of Hertfordshire, Hertfordshire, UK.

<sup>b</sup>Resident Physician, Department of Neurology and Psychiatry, Sapienza University of Rome, Rome, Italy.

<sup>c</sup>Senior Researcher, School of Pharmacy, University of Hertfordshire, Hertfordshire, UK.

<sup>d</sup>Senior Researcher, Department of Neuroscience and Imaging, Gabriele d’Annunzio University, Chieti, Italy.

<sup>e</sup>Chair in Psychiatry, Department of Medical-Surgical Sciences and Biotechnologies, Sapienza University of Rome, Rome, Italy.

<sup>f</sup>Chair in Clinical Pharmacology and Therapeutics, School of Pharmacy, University of Hertfordshire, Hertfordshire, UK.

Please address correspondence to Ornella Corazza, Ph.D., Postgraduate Medicine, School of Life and Medical Sciences, University of Hertfordshire, College Lane Campus, Hatfield, Herts, AL10 9AB, UK; phone: +44 170 728 1334; fax: +44 170 728 4492; email: [o.corazza@herts.ac.uk](mailto:o.corazza@herts.ac.uk)

## INTRODUCTION

Novel Psychoactive Substances (NPSs), also known as “designer drugs,” “herbal highs,” “research chemicals,” and “legal highs,” comprise an ever-increasing number of “chemical,” pharmaceutical, and herbal drugs often advertised as “legal” and “safer” alternatives to International Controlled Drugs (ICDs) (Corazza et al. 2013). NPSs may share with ICDs common ways of consumption (e.g., ingestion, inhalation, injection) and pharmacological properties, but they are often more powerful and harmful (Vardakou et al. 2010).

While the use of ICDs seems to have stabilized over the past decades (EMCDDA 2013), the market of NPSs has significantly grown (INCB 2013), representing an unprecedented challenge in the field of global public health. The international drug control system is floundering, for the first time, under the spread of this new phenomenon; the EU Early Warning System (EWS) of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) has officially reported the appearance of 24 NPSs in 2009, 41 in 2010, 49 in 2011, and 73 in 2012 (EMCDDA 2013).

According to the World Drug Report 2013 of the United Nations Office on Drugs and Crime, the rapid diffusion of NPSs is widespread in 70 countries and territories. For instance, excluding cannabis, in the US the use of NPSs among students is more widespread than the use of any other drug and appears to be more than twice as widespread as in the European Union (UNODC 2013). Within Europe, Eurobarometer data suggest that five countries account for almost three-quarters of all users of NPSs: United Kingdom (23% of the European Union total), followed by Poland (17%), France (14%), Germany (12%), and Spain (8%) (Eurobarometer 2011). Overall, close to 5% of people aged 15–24 (2.9 million people) have already experimented with NPSs in the European Union, which is equivalent to one-fifth of the numbers who have tried cannabis and close to around half of the number who have used drugs other than cannabis. The emergence of NPSs has also been reported in East Asia, the Middle East, Oceania, South America, and several African countries (UNODC 2013).

Over the past few years, there has been increasing recognition from the EMCDDA (2013), International Narcotics Control Board (INCB 2013), governments and international regulatory bodies (e.g., ACMD 2011), the scientific community (Butler et al. 2007; Cone 2006; Hoover et al. 2008; Schifano et al. 2009; Corazza et al. 2012), as well as the public and media (e.g., Bruno, Poesiat & Matthews 2013) of the major role that the Internet is now playing in shaping the recreational NPSs market. Various surveys and studies have shown that the Internet is the most popular source of information about illicit drugs and their use and that this information is often biased and potentially inaccurate (Schifano et al. 2006; Deluca et al.

2012; Corazza et al. 2014a). In this rapid change of drug scenarios, the Internet seems to play a central role in the NPSs business more than it does in the illicit ICDs business (INCB 2013; Bersani et al. 2014).

The number of online shops offering NPSs products for sale in European Union countries increased from 170 in January 2010 to 314 in January 2011 and 693 in January 2012 (EMCDDA 2012). The characteristics of the websites selling these products (e.g., access 24 hours a day, a virtually unlimited number of products available, privacy guaranteed both to retailers and customers, periodic discounts and alerts on new items) provide a constant dynamism of the market with daily new products and advertisements. The competitive conditions of a substantially unregulated market have led to more aggressive advertising campaigns among NPSs online retailers in order to attract a larger number of customers who may be easily manipulated by misleading and false claims (Archer, Treble & Williams 2011).

The aim of the present manuscript was to review and summarize some aspects of the strategies adopted by online NPSs retailers: (1) the appearance of the products; (2) the brand names; and (3) the latest trends in the illicit online marketplaces.

## METHODS

The literature on NPSs online marketing strategies was searched in PsychInfo and Pubmed databases. Considering the limited peer-reviewed data, results were integrated with an extensive and regular monitoring of the Internet (i.e., websites, online shops, chat rooms, newsgroups, fora, eBay, YouTube, Facebook, Twitter, Google Insights for Search) carried out in four languages (English, German, Spanish, Italian) with respect to NPSs online marketing strategies. More than 100 websites were monitored on a regular basis, depending on relevance. A list of 20 key resources monitored is reported in Table 1.

Additional searches were carried out in the database provided by the Global Public Health Intelligence Network (GPHIN). This is a secure, Internet-based early warning system that gathers preliminary reports of public health significance by monitoring global media sources in near “real-time,” 24 hours a day, seven days a week. GPHIN is developed by Canada’s Public Health Agency, and is part of the World Health Organization’s (WHO) Global Outbreak and Alert Response Network (GOARN); it monitors news sources and websites across the globe in nine languages (e.g., English, French, Farsi, Portuguese, Arabic, Russian, Spanish, and Chinese simplified/traditional) (Keller et al. 2009). Permission for the study was granted by the School of Pharmacy Ethics Committee, University of Hertfordshire, Hatfield, UK (November 2013; PHAEC/10-42).

**TABLE 1**  
**List of 20 Key Resources**

Name	Country/Language	Web address	Type of resource
Drugs-forum	International/English	<a href="http://www.drugs-forum.com">www.drugs-forum.com</a>	Open Forum
Bluelight	International/English	<a href="http://www.bluelight.ru">www.bluelight.ru</a>	Open Forum
Legal Highs Forum	International/English	<a href="http://www.legalhighsforum.com">www.legalhighsforum.com</a>	Open Forum
Cannabis café	Spanish	<a href="http://www.cannabiscafe.net">www.cannabiscafe.net</a>	Open Forum
Energy Control	Spanish	<a href="http://www.energycontrol.org">www.energycontrol.org</a>	Open Forum
Overgrow-italy	Italian	<a href="http://www.overgrow-italy.nl">www.overgrow-italy.nl</a>	Open Forum
Shroomery	International/English	<a href="http://www.shroomery.org">www.shroomery.org</a>	Open Forum
Partyvibe	International/English	<a href="http://www.partyvibe.com">www.partyvibe.com</a>	Open Forum
Hipforums	International/English	<a href="http://www.hipforums.com/newforums">www.hipforums.com/newforums</a>	Open Forum
Reddit	International/English	<a href="http://www.reddit.com/r/drugs">www.reddit.com/r/drugs</a>	Open Forum
Zoklet	International/English	<a href="http://www.zoklet.net">www.zoklet.net</a>	Open Forum
Tripme	International/English	<a href="http://www.tripme.co.nz">www.tripme.co.nz</a>	Open Forum
Opiophile	International/English	<a href="http://www.opiophile.org">www.opiophile.org</a>	Open Forum
Erowid	International/English	<a href="http://www.erowid.org">www.erowid.org</a>	Open Forum
Psychonaut	International/sections in six different languages	<a href="http://www.psychonaut.com">www.psychonaut.com</a>	Open Forum
Ice Headshop	International/English	<a href="http://www.iceheadshop.co.uk">www.iceheadshop.co.uk</a>	Online pharmacy
UKhighs	International/English	<a href="http://www.ukhighs.com">www.ukhighs.com</a>	Online pharmacy
Neorganics	International/English	<a href="http://www.neorganics.net">www.neorganics.net</a>	Online pharmacy
Azarius	International/sections in six different languages	<a href="http://www.azarius.net">www.azarius.net</a>	Online pharmacy
Am-Hi-Co	International/English	<a href="http://www.am-hi-co.co.uk">www.am-hi-co.co.uk</a>	Online pharmacy

These sites are still available.

## RESULTS

### Appearance of NPSs and Packaging

The main feature of online marketing strategies developed by NPSs retailers is to present the advertised products as legal and safer alternatives to traditional ICDs (Corazza et al. 2012; Bersani et al. 2002). By doing so, the potential risks associated with the consumption of NPSs are minimized and the presence of psychoactive ingredients is often disguised by not being listed on the packaging (Schifano et al. 2009). Products are often advertised online as “something else” (e.g., “herbal mixtures,” “party pills,” “bath salts,” “incenses,” “fruit jakes,” “Halloween candies,” “fertilizers,” “perfumes,” “pound cleaners”), and thus are less noticeable as drugs (Corazza et al. 2014a). Moreover, the explicit references to their legality affect the users’ perception on the real content. In fact, the idea that legality can equate with safety still remains a common misbelief amongst some recreational users (Corazza et al. 2011).

As in the case of “Spice drugs” (Schifano et al. 2009), herbal compounds are frequently sold in colorful packages designed to appeal to vulnerable consumers, mainly adolescents and young adults. Compounds sold as pills, in addition to a variety of colors, are often

characterized by particular imprints; trademarks like Louis Vuitton, Facebook, Sky, Apple, Rolex, McDonald’s, and Mitsubishi have been found (Kraner et al. 2001). Some of these have given inspiration for new brand names such as “Green Rolex,” “Green Apple,” “Pink McDonald’s,” or “Red Mitsubishi.” These pills mainly contain the empathogenic substance MDMA (3,4-methylenedioxy-*N*-methylamphetamine; “Ecstasy”) or PMA (para-methoxy-amphetamine). PMA is a serotonergic substance of the amphetamine class, with psychedelic and antidepressant properties; it first came into circulation in the early 1970s, when it was used as an alternative to LSD for its hallucinogenic effects. Since the 1970s, it has caused more than 90 deaths in Canada, the US, Australia, and Europe (Vevelstad et al. 2012), mostly related to the consequences of acute temperature elevation (hyperthermia) leading to multi-organ failure occurring at dosages only slightly above the usual recreational range.

In the case of NPSs sold as powders, the term “bath salts” is frequently used in order to give the appearance of legality, taking inspiration from the white crystals often resembling bathing products; they are also sometimes called “jewelry cleaners,” “plant foods,” or “phone screen cleaner.” Usually, these substances contain synthetic cathinones, such as mephedrone, whose psychostimulant

effects are similar to cocaine and amphetamines. Diffusion of mephedrone has reached extremely high levels of popularity among clubbers (Wood, Greene & Dargan 2011) and its abuse is secondary only to cocaine. The popularity of mephedrone has been associated with a decreasing availability/purity of both MDMA and cocaine (Schifano et al. 2011). Mephedrone has been implicated in a number of deaths, especially in the UK, and in 2010 it was banned in several European countries (Mas-Morey et al. 2013).

NPSs Brand Names

A comprehensive analysis of more than 1,000 brand names used to advertise NPSs online has been carried out (Table 2). To our knowledge, this is the most extensive overview of NPSs brand names; however, some limitations related to the extreme volatility of the online market should be highlighted: (1) NPSs are rapidly re-branded; (2) a single brand name often identifies different NPSs in different countries; and (3) often a single brand name identifies various NPSs in different times (Ramsey et al. 2010; Davies et al. 2010). Therefore, the collected data do not allow a statistical analysis aimed at investigating selection criteria of the brand names.

Overall, neither the broad categories nor the brand names are representative of the actual contents of the products (Brandt et al. 2010). The present research suggests that the strategies of choice of brand names are carefully designed to attract customers, especially teenagers, minimizing the possible risks derived from their consumption and maximizing the wanted “highs.” In this context, names

referring to popular movies, comics, animals, or landscapes are frequently used (see Table 3).

In relation to movies, the brand “Black Mamba,” referring to the character interpreted by Uma Thurman in Quentin Tarantino’s *Kill Bill*, has become very popular among young people (Musshoff et al. 2014). This product contains the synthetic cannabinoid AM-2201, and it was banned in 2013 in various countries (Lesiak et al. 2013); as a result of the ban, related cannabimimetic drugs such as 5F-AKB48, rebranded as “Clockwork Orange” in reference to Stanley Kubrick’s movie, have recently reached equal popularity (Drug Enforcement Administration 2013).

In relation to cinema, the NPS “Mad Alice” recalls *Alice in Wonderland* and the NPS “Charlie Sheen” refers to the famous American actor. “Mad Alice” is an herbal blend containing *Turnera Diffusa* (Estrada-Reyes et al. 2009) and *Lactuca Virosa* (Besharat, Besharat & Jabbari 2009) with aphrodisiac and psychedelic properties; the product “Charlie Sheen” initially contained the synthetic cathinone 3,4-methylenedioxypyrovalerone (MDPV) and, since 2012, the psycho-stimulants methiopropamine and ethylphenidate (Welter et al. 2013; Zhu, Patrick & Markowitz 2011).

Among the brand names related to comics, references to characters from Marvel and DC comics have been recorded. For instance, the products called “Krypton” and “Kryptonite” emerged from our searches. “Krypton” stands for the opiod O-Desmethyltramadol (O-DT) (Arndt et al. 2011), linked to various fatalities from overdose during 2010–2011 (Kronstrand et al. 2011). On the other hand, “Kryptonite” can contain both synthetic cannabinoids or lysergic acid amide (LSA), a compound closely related

TABLE 2  
Substances and Brand Names Identified by Monitoring Scientific (PubMed and PsychInfo) Databases and Online and Media Reports

Class	Examples	No. substances identified (=650)	No. brand names identified (=1074)
PIA-related compounds	MDMA-like drugs	179	156
Synthetic cannabimimetics	Spice drugs	220	490
Cathinones	Mephedrone, MDPV	30	67
Tryptamines	5-Meo-DALT	66	18
Psychedelic Phenethylamines (from Shulgin Index)	5-APB, 6-APB	126	94
GHB-like	GHB, GBL	3	18
PCP-like	MXE, PCE	5	47
Piperazines	m-BZP	2	25
Herbal plants	Salvia Divinorum	6	52
Medicines	Pregabalin, Opioids	13	107

Abbreviations: PIA, Para-iodo-amphetamine; MDMA, 3,4-methylenedioxy-N-methamphetamine; 4-MMC, mephedrone; MDPV, methylenedioxypyrovalerone; Meo-DALT, N,N-diallyl-5-methoxytryptamine; 5APB, 5-(2-aminopropyl)benzofuran; 6APB, 6-(2-aminopropyl)benzofuran; GBL, g-butyrolactone; 1,4-BD, 1,4-butanediol; PCE, N-ethyl-1-phenylcyclohexylamine; MXE, methoxetamine; MBZP, methylbenzylpiperazine.



**TABLE 3**  
**Examples of NPSs Brand Names**

<b>NPSs names with reference to movies</b>		
<b>Brand Name</b>	<b>Pharmacological name</b>	<b>Class</b>
Black mamba	AM-2201	<i>Syn. Cannabinoid</i>
Clockwork orange	AKB48	<i>Syn. cannabinoid</i>
Flatliners	4-MTA	<i>PIA rel. compound</i>
Pink Panther	MDAI/5-IAI	<i>PIA rel. compound</i>
Charlie Sheen	MPA/EP	<i>PIA rel. compound</i>
Fantasia	DMT	<i>Tryptamine</i>
Scarface	MDPV	<i>Sub. cathinone</i>
Bounce	4-MMC	<i>Sub. cathinone</i>
Vanilla Sky	2-DPMP	<i>Sub. cathinone</i>
Mad Alice	T.diffusa/L.virosa	<i>Plant</i>
<b>NPSs names with reference to comics</b>		
Scooby snax	AM-694	<i>Syn. cannabinoid</i>
Venom	AM-2201	<i>Syn. cannabinoid</i>
Kryptonite	JWH-018	<i>Syn. cannabinoid</i>
Black Widow	JWH-018	<i>PIA rel. compound</i>
Dr Death	PMA	<i>PIA rel. compound</i>
Green Goblin	5-APB	<i>PIA rel. compound</i>
Dennis the Menace	MDMA	<i>PIA rel. compound</i>
Sparkle Plenty	DMAA	<i>Psy.Phenethylamine</i>
He-Man	5-IT	<i>Tryptamine</i>
Krypton	O-DT	<i>Medicinal product</i>
<b>NPSs names with reference to animals</b>		
Magic Dragon	AKB48	<i>Syn. cannabinoid</i>
King Cobra	JWH-018	<i>Syn. cannabinoid</i>
Wolf Pack	JWH-122	<i>Syn. cannabinoid</i>
Dragonfly	Bromodragonfly	<i>Psy. Phenethylamine</i>
Chicken yellow	PMA	<i>PIA rel. compound</i>
Woof Woof	MDAI	<i>PIA rel. compound</i>
Meow Meow	4-MMC	<i>Sub. cathinone</i>
Snow Leopard	MDPV	<i>Sub. cathinone</i>
White Horse	MDPV	<i>Sub. cathinone</i>
Elephant	5-MeO-DMT	<i>PCP-like</i>
<b>NPSs names with reference to landscapes/space</b>		
Yucatan fire	JWH-073	<i>Syn. cannabinoid</i>
K2	JWH-018	<i>Syn. cannabinoid</i>
Moon rocks	JWH-018	<i>Syn. cannabinoid</i>
Storm	DMAA	<i>Psy.Phenethylamine</i>
Ocean snow	PMMA	<i>PIA rel. compound</i>
Seventh Heaven	2C	<i>Tryptamine</i>
Space Trip	TFMPP	<i>Piperazine</i>
Rainbows	m-BZP	<i>Piperazine</i>
Lunar Wave	MDPV	<i>Sub. Cathinone</i>
Eclipse	Salvia	<i>Plant</i>

(Continued)

**TABLE 3**  
**(Continued)**

<b>NPSs names with reference to the expected psychotropic effects</b>		
Dr. Feel Good	JWH-018	<i>Synthetic cannabinoid</i>
Mr Nice Guy	JWH-018	<i>Synthetic cannabinoid</i>
45 minutes- Psychosis	DMT	<i>Tryptamine</i>
Tripstasy	2C	<i>Tryptamine</i>
Liquid Ecstasy	GHB	<i>GHB-like</i>
Lover's speed	MDMA	<i>PIA related compound</i>
Mr Happy	Methylone	<i>Substitute cathinone</i>
Bliss	4-MMC	<i>Substitute cathinone</i>
Magic mint	Salvia divinorum	<i>Plant</i>
Seven monther	Tropicamide	<i>Medicinal product</i>

Abbreviations: 4-MTA, 4-Methylthioamphetamine; MDAI, 5,6-Methylenedioxy-2-aminoindane; MPA, Methiopropamine; EP, ethylphenidate; DMT, N,N-Dimethyltryptamine; 2-DPMP, 2-diphenylmethylpiperidine; PMA, para-methoxy-amphetamine; DMAA, 1,3-dimethylamylamine; PMMA, paramethoxymethamphetamine; TFMPP, 3-Trifluoromethylphenylpiperazine; m-BZP, methylbenzylpiperazine.

to lysergic acid diethylamide (LSD); in this latter case, retailers advice customers to “Keep Kryptonite out of reach of children and Superman!” (Azarius online smartshop 2013).

In relation to animals, the brands include “Meow Meow” and “Woof Woof.” “Meow Meow” refers to mephedrone (Wood et al. 2012). Conversely, “Woof Woof” refers to 5,6-Methylenedioxy-2-aminoindane (MDAI), a substance with entactogenic properties. When mephedrone was banned in the UK in April 2010, MDAI was introduced to the market as a legal and safe alternative to “Meow Meow” (Gallagher et al. 2012); in the UK, three deaths involving MDAI in 2011 and 2012 have been reported (Corkery et al. 2013).

Brand names related to landscapes (e.g., “K2,” “Yucatan fire”) and space (e.g., “Moon rocks,” “Lunar wave”) are also common. Others include brand names referring to the expected psychedelic effects of chosen products (e.g., “Dr. Feel good,” “Lover’s speed”) or to specific side-effects, as in the case of “Seven Monther,” a brand name for Tropicamide eye drops, indicating “the amount of time (e.g., seven months) that it takes to kill” (Bersani et al. 2013).

### Evolution of the NPSs Online Marketplaces

Although NPSs can be available at local head shops, the Internet plays a crucial role in the distribution of these

products. This has become a highly profitable business, as it provides a number of advantages, including vast pools of customers, swift and easy operational management, and anonymity, while overcoming national and international legislations (Hughes & Winstock 2012). Businesses are advertised on websites, YouTube videos, social networks (Instagram, Facebook, Twitter), as well as drug fora, which are crucial for the exchange of information and promotion of the latest products (Walsh 2011; Lange et al. 2010). Alerts on the latest deals are often sent via SMS and E-mails to non-registered users (Davey et al. 2012). Among the most popular websites, Silk Road deserves the name “Amazon.com of illegal drugs” or “eBay for drugs” (Hout & Bingham 2013; Barratt 2012). Until it was seized and shut down by the Federal Bureau of Investigation (FBI) in October 2013 (Konrad 2013), it operated as a Tor hidden service for the distribution of ICDs as well as NPSs, but also child pornography, stolen credit cards, and weapons (Dasgupta et al. 2013). It has been estimated that approximately 220 distinct categories of illicit drugs were sold on this website (Hout & Bingham 2013). These were able to generate annual sales worth \$22 million (£14.5million), *Forbes* has reported (Greenberg 2012).

However, the largest business we were able to identify so far is related to Performance and Imaging Enhancing Drugs (PIEDs), an umbrella term used to describe a variety of substances taken to enhance human abilities and capabilities. More specifically, PIED drugs include: (1) anabolic drugs such as steroid supplements, used to enhance muscle growth, which were very popular among athletes in the 1980s; (2) opioid analgesic drugs (e.g., codeine, tramadol), which are used for pain relief and as muscle relaxants; (3) image-enhancing drugs taken to change weight, skin coloration, promote/stop hair loss, as well as a variety of beauty and anti-aging products; (4) cognitive enhancers (e.g., adderall, modafinil, piracetam); (5) products labelled as sleep inducers and antidepressant drugs, including prescription drugs (such as benzodiazepines); (6) “sex drugs” and aphrodisiacs, which include prescription drugs (e.g., sildenafil) (Evans-Brown et al. 2012; Corazza et al. 2014b).

Illicit manufacturers and retailers have developed specific marketing strategies to sell these products, including prescription medicines, via Online Pharmacies (OPs) at discounted prices and without prescription (Corazza et al. 2013). In fact, OPs are able to attract a wider range of customers who remain unaware that the products could contain untested or illicit substances (Evans-Brown et al. 2012; Corazza et al. 2014b).

Cultural differences on the ways these products are advertised online have also emerged from our searches. For instance, Bigdeli et al. have recently shown how NPSs in Iran and the Middle East are available in occult and concealed manners on public and legal websites such as

those for real estate or general supplies (Bigdeli et al. 2013).

## DISCUSSION

The Internet represents an integral part of daily life. Far from being merely a virtual place for information exchange, as conceived originally, it has become a means for accessing services and goods via “e-commerce” (Gelatti et al. 2013). The sale of NPSs has not been excluded from this revolution.

In this context of sudden change, a major challenge remains the lack of reliable scientific evidence, which develops too slowly in comparison with the rapid evolution of the drug scenario; in other words, the business-driven NPSs online market is by far more rapid than scientific research. For this reason, Web-based activities represent a prompt response for a better understanding of new ongoing drug trends as well as the provision of preliminary information to professionals working in the field and members of the general public (Deluca et al. 2012). Further, as has recently been demonstrated by the European-Union-funded ReDNet project (Corazza et al. 2013), it is crucial that prevention strategies include health messages to users/potential users via online information and communication technologies (ICTs). Consistent with this idea, Ridout & Campbell (2014) have recently performed a study where Facebook was used to deliver positive messages about safe alcohol use to students, and Free et al. (2010) summarized the evidence for the effectiveness of mobile Web technology interventions for improving health outcomes around the world.

The present article covers some specific aspects associated with the diffusion of the NPSs, and further studies are required. The main limitation of our investigation is intrinsic to the nature of the Internet and the Web sources monitored: the information available online is continuously changing, and our data refer to products which were available until December 2013. It is suggested that monitoring activities should be continued; that more countries, languages, resources, researchers, and health professionals should be involved; and that the findings should be widely shared with public health agencies and health professionals for responding to such a prominent challenge. Large-scale clinical studies are also warranted to confirm and better describe the extent of the NPSs phenomenon and to develop effective strategies to clinically address it.

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